

REMARKS

Entry of the amendment is respectfully requested since it improves clarity and does not introduce new matter. Reconsideration is respectfully requested in light of the foregoing amendments and remarks which follow is respectfully requested.

Claims 7, 8 and 13-16 are pending. Upon entry of the amendment, claims 15 and 16 have been amended. The amendments are editorial in nature. Associating the characteristics more closely with the composition components. In addition, claim 15 has been amended to substitute a "reinforcing" for effective so that it is clear that the amount of filler present is that which reinforces the organic system, e.g. resin, silicone rubber, etc. The arguments previously made relative to rapid dispersibility and the use of enhanced amounts of filler should now more readily tract with the claims. Also, the preamble and the body of the claim are more consistent in their use of terminology.

Claims 8 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al (JP 2000-169132) in view of Wypch (Chapter 6 of the Handbook of Fillers, second edition), Herzig (US 4,101,499), Penneck (US 4,001,128) and Cyprien Guy et al. (US 4,866,661). Applicants respectfully traverse.^{1,2}

Claims 13 and 15.

Claim 15 is directed to a rapid dissolving reinforcing filler composition comprising a reinforcing amount of a surface-modified, aerosol doped-pyrogenically produced oxides. The dopants are specified as cerium, aluminum, potassium, their salts or their oxides. The pyrogenically produced oxides are selected from SiO_2 , Al_2O_3 , TiO_2 , B_2O_3 , ZrO_2 , In_2O_3 , ZnO , Fe_2O_3 , Nb_2O_5 , V_2O_5 , WO_3 , SnO_2 or GeO_2 . The surface modification is a hydrophobic surface prepared by spraying the pyrogenic oxides with one or more compounds selected from octyltrimethoxysilane (Si 108), hexamethyldisilazane (HMDS), polydimethylsiloxane (PDMS) and γ - aminopropyltriethoxysilane (AMEO). The pyrogenically produced oxides have a BET

¹ It is not clear why a dependent method claim was grouped with the composition claims. It appears that the Examiner intended for the claim to be included with the rejection of claims 16 and 7. The claim has been treated below. The rejection of claim 16 upon which claim 14 depends was deemed by the Examiner to require the presence of an additional reference.

² Applicants' comments are based on U.S. Published Application No. 2003/0185739. A request for the translation

surface between 40 and 217 m²/g and a homogeneous distribution of the dopant. Claim 13 further limits claim 15 by specifying the dopant as aluminum oxide and the pyrogenically produce oxide as silica.

Mangold et al. teach a pyrogenically produced silicon dioxide doped with aluminum oxide by means of an aerosol suitable for use in the production of inkjet paper or films. It is characterized as being extremely readily dispersible in polar media, such as water. See paragraph [007]. Other uses are mentioned in paragraph [0015]. There is no mention of a composition like that claimed. There is no mention of the desirability of converting the hydrophilic aluminum oxide doped pyrogenically produced silica to a surface modified doped silica having hydrophobic qualities.

The Examiner has apparently considered the teachings presented in paragraph [0015], selected the use as a filler for polymers from amongst the other approximately thirty, and then assembled the four secondary references to show the existence of the chemical reactions needed to hydrophobize silica. The Examiner then opines that it would have been obvious to modify the Mangold doped product by hydrophobizing its surface to render it unsuitable for its taught purpose for use in the production of inkjet paper and films, which apparently require the presence of a hydrophilic property. None of the secondary references mention hydrophobizing the surface of a doped silica product.

Applicants have previously provided a Rule 132 declaration which establishes, from the Declarant's perspective, unexpected results. In rebuttal, the Examiner suggests that the cited six patents establish the results to be expected.³ The provided explanation on page four of the Office Action appears directed to silica and not to the specifics of the subject matter claimed. None of the documents mention doped, surface modified pyrogenically produced oxides. It is not seen why the observations of the Declarant, one skilled in the art, would be questioned in light of patents directed to different silica material.

identified in a previous office action was made but was never supplied by the Office.

³ The patents include US 6,288,143 (Cardori et al), US 5,739,199 (Eguchi et al.), US 6,384,125 (Bergstrom et al.) and US 6,051,672 (Cappoint) and US 4,344,800 (Lutz et al.).

Accordingly, withdrawal of the rejection is respectfully requested. It is not clear why a reference should be modified in a fashion so that it is rendered unsuitable for its taught purpose. Further, it is not seen why the observation of a person of skill in the art should be dismissed in light of teachings not directed to the specifics of the claimed subject matter.

Claim 8.

Claim 8 further limits claim 15 by specifying the surface modifying compound as octyltrimethoxysilane.

It is not clear from the Office Action, why the selection of octyltrimethoxysilane would have been obvious.

Withdrawal of the rejection is respectfully requested in the absence of a proper *prima facie* case.

Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hemme et al. (US App. 2002/0018741) in view of Wypch (Chapter 6 of the Handbook of Fillers, second edition), Herzig (US 4,101,499), Penneck (US 4,001,128) and Cyprien Guy et al. (4,866,661). Applicants respectfully traverse.

Hemme et al teach a pyrogenically produced titanium dioxide doped by means of an aerosol. The dopants include, aluminum oxide, platinum oxide, magnesium oxide, and zinc oxide. Titanium oxide is used as a photocatalyst or UV absorber. There is no mention of surface modification treatment to render a hydrophilic surface hydrophobic. There is mention of a use in plastics or coatings. See paragraphs [0023] and [0024]. The exemplified uses are in aqueous or acidic environments. Hemme et al. do not teach a use as a reinforcing filler.

The secondary references do not remedy the deficiencies of the primary reference. Accordingly, the teachings of the references, taken alone or in combination, are incomplete to suggest the invention as claimed.

The examiner appears to be of the opinion that the mere showing of the existence of chemistries renders their application in a specified manner “obvious”. That approach is an anathema to statutory obviousness.

A proper *prima facie* case of obviousness has not been established. Withdrawal of the rejection is respectfully requested.

Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mangold et al (JP 2000-169132) in view of Wypch (Chapter 6 of the Handbook of Fillers, second edition), Herzig (US 4,101,499), Penneck (US 4,001,128) and Cyprien Guy et al. (US 4,866,661) as applied to claims 13-16 above and also in view of Lenz (US 3,122,520). Applicants respectfully traverse.

Claims 14 and 16

Claim 16 is directed to a method for producing aerosol doped, surface-modified pyrogenically produced oxides and requires the performance of the following steps: 1) placing aerosol doped-pyrogenically produced oxides in a suitable mixing container, and 2) spraying the oxides with water and/or acid and then spraying the oxides under intensive mixing with the surface-modification reagent or a mixture of several surface-modification reagents under conditions where oxygen is excluded to form the aerosol doped, surface-modified, pyrogenically produced oxides.⁴ Claim 14 further limits claim 16 by specifying the dopant as aluminum oxide and the pyrogenically produced oxide as silica.

While Mangold et al. does teach pyrogenically produced silica doped with aluminum oxide, (see paragraph [007]), Mangold et al fails to teach the claimed two step process. Further, Mangold et al fails to teach a hydrophobic surface modification step or a need for a hydrophobic surface. Applications for the doped silica product are listed in paragraph [0015]. The use in the paper industry is discussed in detail.

The secondary references are discussed above and do not remedy the deficiencies of the primary reference relative to the claimed method steps.

⁴ Similar to claim 15 above, the dopants are specified as cerium, aluminum, potassium, their salts or their oxides. The pyrogenically produced oxides are selected from SiO_2 , Al_2O_3 , TiO_2 , B_2O_3 , ZrO_2 , In_2O_3 , ZnO , Fe_2O_3 , Nb_2O_5 , V_2O_5 , WO_3 , SnO_2 or GeO_2 . The surface modification compound is selected from octyltrimethoxysilane (Si 108), hexamethyldisilazane (HMDS), polydimethylsiloxane (PDMS) and γ -aminopropyltriethoxysilane (AMEO). The pyrogenically produced oxides have a BET surface between 40 and 217 m^2/g and a homogeneous distribution of the dopant.

Lenz, a tertiary reference, does teach a hydrophobing process. However, the Lenz process differs from that claimed. Lenz teaches (col. 2 starting at line 15) the treatment of silica hydrosol under strong acid conditions with prior to reacting the gel with an organosilicon compound (the process is contrasted with alkaline and neutral conditions). The claimed agents are not listed in col. 4.

The teachings provided by the references relied upon in the statement are incomplete on their face to establish a proper *prima facie* case of obviousness. Further there is no rationale provided in the Office Action as to why and how one would adapt the Lenz process to that claimed. Withdrawal of the rejection as it pertains to claims 4 and 16 is respectfully requested.

Claim 7.

Claim 7 further limits claim 16 by specifying the presence of the additional steps of re-mixing the surface modification agent(s) and the aerosol doped, surface-modified, pyrogenically produced oxides for 15 to 30 minutes and then tempering at a temperature of 100 to 400°C for a period of 1 to 6 hours.

Here, to the teachings of the references, taken alone or in combination, do not suggest the additional step described in claim 7 or its presence in the claimed sequence of steps.

Withdrawal of the rejection is specifically requested.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Therefore, it is respectfully requested that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

It is not believed that extensions of time are required, beyond those that may otherwise be provided for in accompanying documents. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. 1.136(a), and any fees required therefor are hereby authorized to be charged to **Deposit Account No. 02-4300, Attorney Docket No. 39509-177800**.

Respectfully submitted,
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